

BRONCHIAL INJECTIONS:

A REPORT,

WITH

A STATISTICAL TABLE,

OF

ONE HUNDRED AND SIX CASES OF PULMONARY DISEASES

TREATED BY BRONCHIAL INJECTIONS.

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FROM THE AMERICAN MEDICAL MONTHLY.

NEW YORK:

EDWARD P. ALLEN, 9 SPRUCE STREET.

1856.

BRONCHIAL INJECTIONS.

BY HORACE GREEN, M.D., LL.D.

It is one year ago last month since I brought before the profession of this country, in a paper read before the New York Academy of Medicine, the subject of the direct medication of the lungs, by means of *catheterism* of the bronchial tubes. The reading of that paper occasioned the appointment, by the Academy, of a Scientific Committee, which was charged with the duty of investigating and of reporting upon this subject. The reports of this committee, consisting of a majority and minority one, were submitted to the Academy, and these, together with the discussion which followed, have been, through the MONTHLY, all laid before its readers.

As this method of treating thoracic diseases has now been continued a twelvemonth longer, during which period a large number of patients have been subjected to this plan, and as the results of the treatment have been in a high degree satisfactory, I have deemed it incumbent on me to state these results to the members of the profession, many of whom have evinced much interest in this subject. The histories of all these cases have been kept by my assistant, Dr. J.W. Richards, and the statistical table which is here appended has been prepared with much care by him from his notes of the cases, taken during the time of their treatment. It is perhaps]proper, also, here to state that the examination of many of these, by auscultation and percussion, was made before treatment, not only by myself, but likewise by Dr. J. Hancock Douglas, of whose skill as an auscultator I shall hazard nothing by saying that it is unsurpassed by few, if by any of the profession, in this country. An examination was also made by Dr. D. in many instances during the progress and

at the close of the treatment, and in all such cases the physical signs, as observed by him, are given in the cases reported.

It will perhaps be remembered that the history of several cases, presenting all the physical and rational signs of tuberculosis, were given in the paper read before the Academy, which cases had been treated with apparent benefit by injections into the bronchial tubes. To those who have been interested in this subject—and it is only for those of the profession who regard progress in practical medicine as a desideratum, that I write—it will be a gratification to learn what has been the result in these instances, after a period of twelve or fifteen months. The first case described is that of a patient (a lady) who, having a large vomica in the right lung, was, in fact, in an advanced and hopeless stage of tubercular consumption.* The injections were employed, not with the expectation of curing, but with the hope of relieving the patient. During a period of some fifteen days, “the elastic tube was introduced into the left bronchial division seven times, and on each occasion from one and a half to two drachms of a strong solution of the nitrate of silver was injected into the lungs. Her cough and expectoration were greatly diminished, she breathed with more freedom than before, and she grew stronger and gained flesh in this period.” While she remained under treatment, her symptoms improved constantly, but being obliged to return to her home in Connecticut at the end of the above period, she soon after became worse, and died about two months after leaving New York.

The three other patients, whose cases are described on pages 17–22, and who exhibited—certainly two of them—unequivocal signs of early tuberculosis, are all not only alive at this present time, but are in the enjoyment of a much better state of health than when the treatment was commenced. One of these, indeed, Miss V. (see p. 20), called on me eight months after the treatment, and was then in the enjoyment of most excellent health.

In a paper, which I had the honor to read before the State Medical Society, at Albany, in February last, and which

* *Am. Med. Monthly*, Jan., 1855, p. 15.

may be found printed in the published Transactions of this Society,* I reported several other cases of thoracic disease of much interest, which appeared to have been successfully treated by this plan of tracheal injections. As the previous history and sanitary condition of these patients, on coming under my care, were well known to other medical men, it cannot fail to interest the profession to know the result, after the termination of nearly a twelvemonth, in these cases also. Allusion is made in that paper to twelve cases, in the treatment of which catheterism of the air-passages, for a greater or less number of times, was employed. Of this number of patients, seven "manifested distinct physical signs of the presence of tuberculosis." Five were affected with chronic bronchitis. The history of one or two of these cases, abridged from the paper to which allusion has been made, I shall give.

December 4th, 1854—J. B. Minor,† Professor of Law in the University of Virginia, came to New York for medical treatment. He was accompanied by his friend and colleague, Dr. Davis, the distinguished Professor of Anatomy of the University. Prof. Minor, as I learned from Dr. Davis, had suffered from thoracic disease, following chronic follicular disease of the pharynx for nearly a year before I saw him. Enfeebled by the journey, the patient was unable to leave his room for a week after his arrival in New York. A severe cough, with great debility, emaciation, and occasional hæmoptysis, were the rational signs most prominently manifested in his case. At the top of the right lung, there is dulness on percussion, and a less degree of expansion of the chest during inspiration is observed, at this point, than in the corresponding portion of the other side. Expiration is also prolonged on this side, whilst the respiratory murmur is augmented in force under the left clavicle. Bronchial râles are heard on both sides, while a severe cough, with large muco-purulent expectoration, which is occasionally streaked with blood, is present. Evidence of the presence of long-continued follicular disease exists, for the mucous crypts of the pharynx

* Transactions of the State Medical Society of the State of New York. 1855. p. 233.

† *Ib.*, p. 245.

have disappeared, and the right tonsillary gland is entirely destroyed, and its place, between the anterior and posterior columns, is occupied by a large deep ulcer. Applications of a strong solution of nitrate of silver were first made directly to the ulcerated portion of the throat and the pharynx, and at the third application the sponge-probang was passed into the larynx. These operations, combined with appropriate general treatment, were repeated daily until the eleventh of December. Under this topical medication, the ulceration in the throat was healed, and the cough to some extent diminished; but this symptom was still severe, and the bronchial expectoration and other thoracic symptoms remained about the same as at first. At this period (Dec. 11th), in the presence of Prof. Davis and several other physicians, I introduced a flexible tube down to the right bronchial division of the trachea, and injected one and a half drachms of a solution of nitrate of silver through this tube into the lung. On the 12th, the injection was repeated, and this operation of catheterism of the air-tubes, alternating occasionally with the use of the sponge-probang, was continued until the 25th of the month. Under this treatment, the cough and expectoration of the patient rapidly diminished, his appetite returned, and his strength and general health improved daily. He had in this time gained several pounds of flesh, his cough and expectoration, which had harassed him for months, had disappeared; and from an enfeebled condition, which prevented him from walking the distance of a block without assistance, he had regained so much in strength and vigor, that, for several days before he left New York, he walked daily two or three miles without fatigue or inconvenience. On the day of his departure for home, which was on the 25th of December, an examination of his chest was made, not only by myself, but by several other good auscultators, when it was found that the physical signs which were present at first had quite disappeared.

One year has now elapsed since Prof. Minor returned home to resume his duties as lecturer in the University of Virginia. In a letter received from Dr. Davis, some time after his return, he thus writes: "It will be gratifying to you to know that Prof. Minor has not been compelled to suspend his lec-

tures, or to omit his daily exercise, since his return, for a single day." These duties, I believe, he has been enabled to discharge unremittingly up to the present time.

This case of Prof. Minor's is one of great interest, and as it was seen before and during treatment by many intelligent members of the medical profession, I do not hesitate, in view of this fact, to declare that it was one of those cases of thoracic disease, in the successful treatment of which *general* remedies have hitherto utterly failed.

I shall only allude to one other patient, whose case is recorded in the paper to which I have referred.

John Moore,* aged thirty-five, came under treatment Sept. 24, 1854. For several years this patient has suffered occasionally from chronic pharyngeal disease and enlarged and diseased tonsils. One year before, debility, with emaciation, cough, &c., came on, which symptoms continued to increase during the winter and spring of 1854. When first seen, a very troublesome cough, a free muco-purulent expectoration, with dyspnoea, emaciation, and great debility, were the prominent symptoms in his case. The physical signs were correspondent. Dulness on percussion, with crepitating râles, were observed over a part of the right lung. Near the upper portion of this lung, strongly-marked signs of a tubercular excavation were present. These physical signs were observed by several good auscultators.

The same plan of treatment as that employed in the preceding case was followed in the case of Mr. Moore. Topical applications of the nitrate of silver were first made to the pharynx, and subsequently into the larynx and trachea, and these were continued until the 13th of November, when the use of injections into the bronchial tubes was commenced. These operations, together with appropriate general treatment, were continued until the 15th of January. Within twenty-four hours after the first injection, both the cough and the expectoration of the patient began to diminish. He soon commenced to regain flesh and strength, and every unfavorable symptom continued steadily to decrease. On the 6th January, 1855,

* Trans. State Med. Society, p. 248.

along with my colleague, Prof. E. H. Parker, I made a careful examination of the patient's chest. The respiratory murmur could be heard full and clear on both sides; prolonged expiration in one location was the only abnormal sign present.

January 25th—Mr. Moore called and reported himself "quite well." He has no cough or expectoration except some slight raising in the morning. He is quite strong and hearty, can walk any reasonable distance, and attends constantly to his ordinary business.

Nearly a twelvemonth has passed since this patient was dismissed. During this period, he has been able to attend constantly to business, and still continues in the possession of an ordinary degree of health.

This was one of the patients seen by the Committee appointed by the Academy to inquire into this plan of treatment, and in whose presence the tube was introduced into the trachea, "and an injection of a solution of nitrate of silver of the strength of thirty-five grains to the ounce was thrown in." *

In this paper, read before the State Medical Society, allusion is made to ten other cases, in the treatment of which catheterism of the air-passages, for a greater or less number of times, was employed. Several of these patients manifested distinct physical signs of the presence of tuberculosis. Five of the number were affected with chronic bronchitis, in four of which the disease had continued several years, and was complicated with incipient tuberculosis. "These cases were all treated at first by cauterization of the larynx and trachea, and by appropriate general treatment, followed by the injection of the solution into the lungs. Some have already been dismissed cured, or materially relieved; others are still under treatment, and the result, of course, cannot at present be given."

Included in the tabular statement which follows at the conclusion of this paper, will be found, not only a further history of these cases, but also a tabular record of all the cases which have been treated by tracheal injections during the last year, or since I presented before the New York Academy of Medicine

* American Med. Monthly, July, 1855. p. 40.

my first paper on this subject. The whole number of cases in which this treatment has been employed since its adoption, in October, 1854, amounts to one hundred and six. These cases are given in their chronological order; but they may be arranged very appropriately into four principal divisions, namely, *incipient tuberculosis*, *advanced tuberculosis*, *bronchitis*, and *spasmodic asthma*.

Although all the principal points in these cases, and the result of the treatment, so far as this can be known, are given in this tabular statement, yet I shall select from each of these divisions one or more cases, whose history and management will be more fully detailed, in order the better to illustrate that class of diseases for the treatment of which this form of topical medication is the most appropriate.

I.—Cases Presenting the Usual Rational and Physical Signs of Incipient Phthisis.

CASE I.—R. L., of Springfield, Mass., aged thirty, of large frame, dark complexion, hair, and eyes, came under treatment November 3d, 1854. In September, 1853, he contracted a severe cold, which was followed by a hard, dry cough. Free expectoration of mucus at length took place, and this, together with the cough, continued through the following winter. These symptoms were abated somewhat during the summer of 1854, but the cough never entirely left him, and on the approach of cold weather all his unfavorable symptoms were greatly increased. Examined November 3d, 1854, his case presented the following symptoms:—He was emaciated; sallow countenance, constant cough, which was now attended with muco-purulent expectoration; night sweats, frequent pulse, hoarseness, with chronic folliculitis. On examining the chest, there was dulness on percussion under the right collar bone, and auscultation revealed sibilant and crepitant râles, with prolonged expiration throughout the upper part of the right lung, and decided increase of the vocal resonance. On the left side, the respiratory sounds were slightly augmented in force, but otherwise normal. His mother, who accompanied him, stated that the family was not supposed to have any hereditary tendency to consumption. At a subsequent visit, a few days later, Prof. E.

H. Parker and Dr. Douglas both examined this patient, and finding the above signs present, coincided with me in the opinion that tubercular exudation existed in the right lung.

The treatment consisted of both local and general measures. Topical applications of the nitrate of silver were made first to the fauces and pharynx and aperture of the glottis, and subsequently into the larynx and trachea, and the iodide of potassium, with the proto-iodide of mercury, was administered internally. These measures were continued (the applications being made almost daily) until the 17th of November, when the tube was introduced, and a drachm and a half of the argentine solution injected into the right tracheal division. Between the above period and the 20th of December, at which time the patient left for his home, this latter operation of catheterism was performed fifteen times, and on each occasion from one to two drachms of the solution of the strength of from twenty to thirty grains to the ounce of water were employed.

Under this treatment the patient improved gradually, but constantly; his cough and expectoration diminished; his strength increased; he gained flesh; and nearly all his unfavorable symptoms disappeared. A corresponding improvement took place in the physical signs. Before he left, Dr. Parker again examined this patient, at my request. Some dulness is still apparent at the upper portion of the right lung, yet much less than at first; but the crepitant râles have disappeared, and the respiratory murmur can be heard throughout the whole extent of the right lung. The patient has an occasional slight cough, but with little or no expectoration. Says he has a good appetite and "feels well."

This present month, December 13th, one year later, Mr. L., being in New York, called at my office. He is looking well, has gained still more flesh and strength, has been able to attend to his business constantly, as a merchant, during the past year. At this time a minute examination of the patient's chest was made by my assistant, Dr. Richards, and myself, and a flatness, on percussion, over the right lung, was the only abnormal sign that could be detected.

Remarks.—If dependence is to be placed for a correct diagnosis upon the admitted rational and physical signs of tuber-

culosis, then this patient's case presented at first the unequivocal indications of the presence of this disease ; and although we cannot yet positively aver that these abnormal symptoms have all disappeared, still it must be admitted that we have every reason to believe that an arrestment of the pulmonary disease, in this case, has been effected.

CASE II.—During the latter part of last summer, I received a letter from Prof. Bledsoe, of the University of Virginia, requesting me to take under my care the daughter of a particular friend of his, (the Rev. Dr. S., of that State,) who was considered by her friends to be suffering under pulmonary disease. It was proposed that she should visit New York as soon as the summer heat had subsided.

September 10—Miss S. came to my office, and her case was examined. Eighteen months before, when about nineteen years of age, a slight cough came on, attended with emaciation, loss of appetite, and occasional hæmoptysis. In May, a little over four months previous to her visit to New York, she became worse, her cough was harder and more frequent, and the expectoration was frequently mixed with blood ; these were among the symptoms that characterized her case at the time of her first examination. She is tall, has a narrow chest, a dark, sallow countenance, with considerable emaciation. On examination of the chest, there was marked dulness under the right clavicle, with feeble respiration ; the expiration was prolonged, and crepitant râles were quite apparent throughout the upper portion of the right lung ; the left lung appeared normal. A severe cough, with muco-purulent expectoration and frequent hæmoptysis, were the prominent rational signs. The patient and most of her friends had had no faith in any other but homœopathic treatment, and she had been induced to seek for other aid only through the earnest solicitation of her father's friend, Prof. B.

It will be unnecessary to detail minutely the measures adopted in the treatment of Miss S.'s case. The iodide of potassium in combination with the bitter vegetable tonics was administered. Topical applications with the sponge-probang were made to the aërial passages for several weeks, followed by the injection of the nitrate of silver solution into the right

bronchi, as in the preceding case. The phosphate of manganese, with the tincture of cinchona, and a generous diet, were also ordered for the patient towards the close of the treatment. The topical measures were continued until the 29th of October—for a period of six weeks—when the patient left the city to visit some friends residing in Massachusetts. At this time her unfavorable symptoms had nearly all disappeared. She coughed but very little, and had but little expectoration, and no hæmoptysis. Her flesh and strength had both increased, and her countenance and general appearance were both indicative of returning health.

On the 16th of November this patient returned to New York, on her way to Virginia. At this time I made an examination of her chest. A little flatness on percussion is perceived on the right side, but the respiratory murmur is heard distinctly throughout the entire lung; no râles can be detected. She has no cough, no expectoration; has gained still more in flesh and strength, and says, with the exception of her chronic catarrh, she “feels quite well.” She was directed to continue her tonic, to live well, and in appropriate weather to exercise in the open air.

Miss S. returned to Virginia, and I heard nothing more of her case until the present month, when I received a letter, dated January 17th, 1856, from which I extract the following:

“My general health, since my return home, has been very good. I have discontinued the tonic which you gave me, because it seemed to have fully accomplished its work. My appetite is good, I look well, and have fully my usual strength.”

Remarks.—In the discussion which took place in the New York Academy of Medicine on the employment of topical medication in the treatment of cases of pulmonary disease, it was asserted by a member of the committee that no reliance could be placed on the apparent improvement of patients under these circumstances, as it is well known that consumptives often made great improvement for a time, “under the hope inspired by a new mode of treatment.”

The favorable change, however, which has attended the treatment of Miss S.’s case cannot be attributed to any “con-

trolling faith" in its efficacy, as may be seen from the following extract from the letter from Prof. B. to which I have referred : " Miss S. thinks you will do her no good, and her mother is entirely opposed to the experiment. * * * * I take this step in opposition to the wishes of every other member of her family, and of the family connexions. They all fear that consumption will follow. I am sure if it should, it will not result from your treatment ; and feeling thus sure, I am determined to take the responsibility. If it should follow, I shall be blamed for the pertinacity with which I have insisted upon the abandonment of homœopathic quackery, and on the necessity of applying to you. But I am satisfied ; for I know that I am doing right."

CASE III.—C. H., of Jersey City, aged thirty, an officer of the Customs, had shown some indications of thoracic disease, when about twenty-two years of age, for which a change of climate was advised. In January, 1849, he sailed for California, where he remained over two years, returning to New York in March, 1851, apparently in good health. In April, 1855, by exposure in a storm, he took cold,—a cough came on, followed by expectoration, night sweats, great loss of strength, hæmoptysis, and emaciation. During a part of the summer of 1855, he was under homœopathic treatment, but without any improvement. He then consulted a physician of this city, by whom his night sweats were relieved for a time, but his cough, emaciation, and other symptoms continued.

" On the 15th of September," (I shall here quote from the record of my assistant, Dr. Richards,) " C. H. came under our care, with the following symptoms : countenance dusky, pale, wrinkled ; cough severe, particularly in the morning, when he expectorates large quantities of muco-purulent matter ; is very feeble, emaciated, weighing only ninety-four pounds ; loss of appetite ; skin dry and feverish ; pulse 110. He has chronic pharyngo-laryngeal disease, with elongated uvula.

" The physical signs indicate extensive bronchial disease of both lungs, complicated apparently with tuberculosis of the right lung. There was dulness on percussion under the right collar bone, moist crepitating râles, with prolonged expiration."

Treatment.—A portion of the elongated uvula was removed. Applications of a solution of the nitrate of silver were made once in two or three days to the pharyngo-laryngeal membrane, and the iodine, with vegetable tonics, was internally administered. The cauterizations were continued until the 20th of October, when the patient not improving in his general symptoms (although his cough and expectoration had in some degree diminished), the flexible tube was introduced, and a drachm of the solution injected into the bronchial divisions. The same result which had followed the employment of the tube in many other similar cases occurred in this instance, the cough and expectoration diminished more rapidly than before its use. These injections, alternating with the use of the sponge-probang, have been continued up to the present time, January 1st, 1856, and the following is the patient's condition:—He has nearly regained his usual strength; has very little cough or expectoration; pulse much diminished in frequency; and his present weight is 115 lbs.

Auscultation reveals slight bronchial irritation of the right lung; no râles, no prolonged expiration; the respiratory murmur is feeble, but distinct over the whole of the right lung.

January 14th—Examined Mr. H. to-day, and find his pulse at 74. He has neither cough or expectoration except a little "clearing of the throat" in the morning. He feels quite well, and looks well, and is quite able now to attend to all his duties as an officer of the Customs.

CASE IV.—In December, 1853, A. Y. R., twenty-six years old, came to this city, with a letter from Dr. Smith, of Riga, by whom the patient was recommended to my care. Seven years before he had an attack of mumps, and, following that disease, had experienced more or less irritation in the throat, which was caused by an occasional cough and a disposition to clear the throat by frequent "hawking."

About one year ago a cough came on, which has been prominent ever since. Four or five members of his family have died of phthisis.

Present condition: The patient is emaciated, has a phthisical aspect; the pulse is accelerated; cough and expectoration considerable, and during the last year he has had an occasional

hæmoptysis. Over the apex of each lung percussion elicited sounds slightly dull ; respiration decidedly rude, with resonant voice on the right side, left, tolerably clear.

Both tonsils were enlarged and diseased ; the right gland had two large openings in it, through which pus oozed when the tonsil was pressed upon by the finger ; the uvula was elongated, and the pharyngeal membrane covered with enlarged and diseased follicles.

The hypertrophied and diseased portions of the tonsillary glands were excised, the uvula truncated, and the applications of the nitrate of silver made to the fauces and pharynx, and subsequently into the larynx. The local, with appropriate general treatment, was continued about four weeks, or until January 9th, 1854, when the patient returned to his friends, considerably improved in health. His cough and expectoration were much improved, and he had regained flesh and strength. These favorable symptoms continued until some time in February, when, being exposed at night in an open carriage, he took cold, and all his unfavorable symptoms returned with increased severity.

He came back to New York the 27th of the same month, and was again under treatment, both topical and general, for several weeks. He was once more greatly benefitted by the treatment, and although the cough was never entirely absent, and the hæmoptysis occasionally recurred during the whole season, yet he increased in weight and strength, and was enabled to attend to his ordinary mercantile business through the Spring and Summer of 1855. Sometime during this latter period, Mr. R., being in the country, had unfortunately an attack of influenza, by which his former symptoms of pulmonary disease were renewed with increased severity. He did not, however, return to the city until quite late in the Fall, so that a period of eight months intervened between his last treatment and the 5th of November, when he once more came under my care.

He was now considerably emaciated ; had purulent expectoration ; and the hæmoptysis, which had occurred moderately at intervals for three years past, was more copious, and more frequent in its recurrence. Auscultation revealed the existence

of a tubercular deposit in the right lung, and the rational signs present confirmed this opinion.

Recourse was again had to cauterizations of the larynx and trachea, together with the internal administration of those general remedies, which had before benefitted the patient. But their use was not followed by that improvement which had attended their earlier employment, for the cough and expectoration continued, and the attacks of hæmoptysis, which for three or four months had occurred at very regular intervals—once in two weeks—had become severer than ever. The tube was now used, and injections of a solution of nitrate of silver were thrown into the bronchi every second or third day, for several successive weeks. Improvement began with the adoption of this treatment, and continued constantly to advance during its employment. There was no return of the hæmorrhage after the first bronchial injection; the cough and expectoration rapidly decreased, and the patient gained daily in strength and weight.

On the 30th of November, this patient was examined in the presence of several medical gentlemen who had watched the progress of his case during the treatment. His countenance has lost its phthisical aspect; he has increased several pounds in weight in the last six weeks. His cough and expectoration have nearly disappeared. The dulness over the right lung is barely perceptible, the respiratory murmur is present, but neither râles nor prolonged expiration can be detected. He returned to his home in better health than he has had for years.

II.—Cases exhibiting the Effect of Catheterism of the Lungs in the Advanced or Confirmed Stage of Tuberculosis.

Since the proposition was made to employ injections in the treatment of advanced phthisis, the question has frequently been asked, whether it is claimed that the tubercular cavities may be injected, or what is the therapeutic object proposed to be obtained by this treatment? "When these cavities communicate with bronchial tubes, and are not seated in the upper portion of the lungs," it is undoubtedly possible that this operation may be performed, although its positive accomplishment

has never been claimed ; but this is not the end desired, Recent histological observations have fully established this pathological fact, that in all cases of tubercular deposit, there occurs in the immediate vicinity of the exudation more or less of an inflammatory action, in which all the adjacent structures are involved. The bronchial membrane, and the pulmonary parenchyma, become at once congested, and subsequently inflamed. The terminal extremities of the bronchi, says Prof. Bennett, are among the first structures affected, and as the tuberculosis proceeds, all the appearances characteristic of chronic bronchitis are produced, and are constantly going on in the progress of a case. "Consequently," he observes, "the great problem to be worked out, in the treatment of pulmonary tuberculosis, is that, while on the one hand, it is a disease of diminished nutrition and weakness, and consequently requires a general invigorating and supporting system of treatment, on the other it is accompanied by local excitement, which demands an antiphlogistic and lowering practice."*

It is to meet this last indication—to subdue the local inflammatory action in the immediate vicinity of the exudation—an action which, if continued, will not only effectually prevent the disintegration and absorption of the tubercular mass, already formed, but which will tend to augment the mass, that applications of the nitrate of silver solution to the congested and inflamed membrane, are advised in early as well as in advanced tuberculosis. The following cases will illustrate the effect of this treatment, when employed late in this disease.

CASE V.—B. M., aged thirty-six years, from Pittsburg, Pa., in height over six feet, with full chest, dark eyes and complexion. Has had an occasional cough, with chronic folliculitis, for four years ; until 1854, was always better in Summer. In June of this year, hæmorrhage from the lungs occurred, and again in October, his cough also increased, and emaciation and night sweats followed. Accompanied by a younger brother, who for several months had suffered under symptoms similar to his own, he came to New York in October, and both placed themselves under a doctor, whose newspaper advertisements

* The Pathology and Treatment of Pulmonary Tuberculosis. By John Hughes Bennett, Professor, &c., in the University of Edinburgh. p. 68.

offered, through "inhalation," a cure to all consumptives. During a period of five months, inhalation was faithfully followed. In two weeks after commencing this treatment, a severe pulmonary hæmorrhage came on, and this occurred four times during the treatment. The patient continued to emaciate ; his cough and expectoration increased, and he grew daily weaker. He was advised to go South, and left the latter part of the Winter for a milder climate. Not being benefitted, however, by the change, he returned to New York again, and on the 20th of April, 1855, came, with his brother, (in whose treatment inhalation had proved equally unsuccessful,) and placed himself under my care.

The case at this time exhibited every sign, both rational and physical, of confirmed phthisis. The right lung appeared full of tubercles, and auscultation revealed a large vomica in its upper portion. On directing the patient to cough, the succussion produced a distinct "splash" in the cavity, occasioned by the motion of the air through its fluid contents. A severe cough, emaciation, hectic, and night sweats, were present. The patient was very feeble, and daily expectorated large quantities of pus, mixed occasionally with blood. Mr. B., who was a well-educated and an accomplished gentleman, understood well the incurable nature of his disease ; but he expressed a desire to submit to any plan of treatment that would tend to mitigate the severity of his symptoms. To detail fully the treatment which was adopted will be unnecessary. The sponge-armed probang, wet with a forty-grain solution, was first applied to the pharynx and glottis, and subsequently to the larynx and trachea, and a supporting plan of general treatment was adopted.

After some eight or ten applications, the flexible tube was without difficulty introduced into the trachea, and a drachm and a half of the solution thrown into the right bronchia. This treatment was continued over two months, catheterization being employed about three times a week during this period.

As constitutional remedies, the phosphate of manganese, with vegetable tonics, and a generous diet, were also advised. The effect produced on the patient by the first injection was remarkable ; his cough and expectoration were almost entirely arrested

for twenty-four hours, without the occurrence of any unpleasant symptoms; and the patient continued to improve daily as the operations were repeated.

July 10th—Mr. B. was to-day examined by several of my medical friends, who saw and examined the case at first, and who have watched its progress during the above treatment, and the following is found to be his condition.

He has gained considerable in weight. With the exception of a slight coloring of blood, occasionally seen in the expectoration, the hæmorrhages have entirely ceased since the employment of the injections; the cough and expectoration have lessened more than one half; his strength is greatly improved. The moist râles and "splash," which were heard at first in the right lung, cannot be heard, but there is still dulness on percussion, and a dry blowing sound is observed in the place of the vomica. Mr. B. wished to leave the city during the greatest heat of the Summer; he was advised to go to Lake Superior, and he left on the 14th of July for that region.

Several times during the Summer and Fall Mr. B. was heard from through his friends, and in every instance the report was favorable with regard to the continued improved condition of his health.

January 8th, 1856—To-day, Mr. B., who has returned to New York, called at my office. He appears in better health than when he left the city, six months ago, and says that while he was in the region of the Lakes, he felt quite well, that he had neither cough nor expectoration, and was able to endure much exposure and fatigue, as he did in hunting and fishing, without any injury to him whatever. He had not time then to have his chest examined, but has promised to call in a few days for this purpose.

CASE VI.—G. B., a resident of Nashville, Tenn., thirty-two years of age, called on me October 19th, 1855, bringing a letter of introduction from Dr. Wallace, of Dublin, Ireland. He had just returned from Europe, where he had spent several months for his health, having consulted, while abroad, several distinguished foreign physicians, and among them Dr. W., under whose treatment Mr. B. had been for some time, and who commended him to my care, on his arrival here. Dr. W. had

considered his case, and had treated it as one of chronic folliculitis, complicated with tuberculosis.

The following is the record from the case-book of Dr. Richards:—Our examination revealed ulceration of the tonsils and elongation of the uvula, with disease of the follicles of the pharynx, and ulceration of the sub-tonsillary fossæ, œdema of the epiglottis, and ulceration of its border. By auscultation and percussion, the presence of tubercles in both lungs was discovered, most extensive in the right, in the upper lobe of which a large vomica was found. The rational symptoms were marked and urgent, viz., aphonia, cough severe, with abundant purulent expectoration, emaciation, countenance pale and sunken, great debility, with nervousness and sleeplessness at night."

The same plan of treatment which was employed in the preceding cases was adopted in this. Topical medication of the upper part of the respiratory passages was followed by injections of the fluid into the bronchi. "The patient gradually and steadily improved under this treatment; his cough diminished constantly after the commencement of the local treatment, without the administration of any cough mixture whatever, and the expectoration decreased and became more mucous. The treatment was continued about four weeks. On the 13th of November, he left for his Southern home. Examining his case at this time, I noticed the following improvements: The cough and expectoration had greatly diminished—considerably more than one half in amount; he had nearly regained his voice; his strength was improved; and the cavity on the right lung was sensibly diminished, and was completely dry. Mr. G. has not been heard from since he left."

Dr. Cotton, of London, who, in his valuable work on consumption, highly recommends topical medication in the treatment of laryngeal phthisis, says that, although he has known "the voice regained, the irritable cough removed, and the tenderness and difficulty of swallowing dissipated entirely by it" * in this disease, yet he would not advise it to be practised when the pulmonary disease is in a *very* advanced stage, and the strength of the patient much exhausted.

* The Nature, Symptoms, and Treatment of Consumption. By Richd. Payne Cotton, M.D., &c. pp. 237-8.

I confess I have never seen any injury result from the use of topical medication appropriately employed, even in the latest stages of the disease. As a palliative, it fails in some cases, but in many instances have the last words of the dying consumptive been employed, in expressing his gratitude for the relief afforded him from that irritating and harassing cough which so often torments the patient in the later period of this disease.

CASE VII.—In August of last year, Dr. Mason, an intelligent physician from Alabama, came to New York, with his brother, a young gentleman twenty-one years of age, then in an advanced stage of consumption. The pulmonary disease had been preceded by, and was complicated with, severe chronic laryngitis. The epiglottis was cedematous, and it, together with the sub-tonsillary fossæ, was extensively ulcerated; there existed, consequently, great difficulty of deglutition and complete aphonia. The patient was extremely emaciated, and very feeble—more so, because the great difficulty in swallowing had prevented him, for many weeks, from taking food, except in very small quantities. The physical signs indicated the existence of tubercles in both lungs, but the disease had made much the greatest progress in the right lung. Dr. Mason desired me to take charge of his brother, and to do all in my power to relieve him and to prolong his life. In order to lessen the difficulty of deglutition, and to allay the constant irritation of the throat, the ulcerated parts were cauterized with a solution of the strength of 80 grs. of the nitrate of silver to an ounce of water. Under the local and a general tonic treatment, these urgent symptoms were greatly relieved for a time. Dr. M., who remained with his brother several weeks, and who had observed the beneficial effects of the treatment in other cases under my care, was anxious to have the injections employed in his brother's case, with the hope that the pulmonary disease might to some extent be arrested. These were employed, but they failed to produce any permanently beneficial effect.

Although the cough and expectoration appeared for a short time to be diminished, yet the pulmonary disease continued to make rapid progress. On the 25th of September, Mr. M. left for his home in Alabama, and died in the following November.

In several other similarly complicated and advanced cases, where the laryngeal symptoms have predominated, the pulmonary injections have not afforded that relief we are sure to obtain from the use of the sponge-probang ; but still, in none of these instances have I observed any unfavorable symptoms to follow their employment, unless this may be considered to have been the result in case 100. This case was that of a gentleman from Jacksonville, Florida, who was hereditarily predisposed to the disease. He came to this city in October last, in an advanced stage of tuberculosis. He had declined very rapidly, was greatly emaciated, having lost fifty-five pounds of flesh during the six months that preceded his visit to New York. His cough was harassing, and was attended by a profuse, purulent expectoration, with occasional hæmoptysis. The presence of a large vomica was revealed in the left lung, by the heavy plash which was heard whenever the patient coughed.

The treatment was commenced on the 28th of October, and for a time the patient improved rapidly. " At this stage of the case, Nov. 7th, (I quote from Dr. R.'s case-book,) Mr. S. seemed greatly improved ; the cough and expectoration were well nigh gone, the plash was less, and he felt much better every way, except in his sleeping. Upon his reporting that he slept but two or three hours each night, a mild anodyne was prescribed (McMunn's elixir), of which he took a few doses ; in all, about two drachms.

After this, he became perfectly wakeful ; did not sleep at all for forty-eight hours, and but very little for a week. From this time he gradually failed ; no appetite and no sleep ; no pain ; no diarrhoea ; but occasional profuse perspiration, with great and increasing dyspnoea, until November 26th, when he died. Did the improvement (drying up of the vomica ?) intensify the disease in other parts of the lungs, or in other organs ? "

No autopsy was permitted.

III.—Cases of Bronchitis Treated by Catheterism of the Bronchial Tubes.

In the paper read before the New York Academy of Medicine, on the subject of topical medication of the air-passages,

it is maintained that whenever, in the treatment of bronchial disease, this remedy has been freely employed, its effects have been invariably salutary. Subsequent experience in the treatment of chronic bronchitis will fully sustain this favorable opinion of the results of the practice.

I shall attempt to illustrate its effects by a report of one or two cases only.

CASE VIII.—A young man, aged twenty-three years, from the interior of Pennsylvania, called on me the 7th of Sept., 1855, bringing a letter from his physician, by whom he had long been attended, requesting me to examine the patient, and treat his case in the manner I should deem advisable. His disease, on examination, proved to be chronic bronchitis, long continued, and of a severe character.

Six years before, he had first suffered from an acute attack of the disease, from which he had been relieved. The affection was renewed once in two or three months afterwards, for a period of three or four years; but it became at length chronic, and continued.

Auscultation revealed extensive bronchial inflammation of both lungs, but the left side was more involved than the right. Some signs of a tubercular deposit in this lung were apparent; for the free, muco-purulent expectoration was often mixed with blood, and slight dulness was evident on percussion; but his pulse was moderate, 80 in the minute, and he had no hereditary tendencies. At some periods, when the paroxysms of coughing were very severe, the patient would expectorate eight or ten ounces in the course of the twenty-four hours, and occasionally, though rarely, almost pure blood was raised. He is not greatly emaciated, and his strength is tolerably good, but he cannot endure severe exercise.

Treatment.—Cauterizations with the sponge-probang were applied for a week or ten days to the opening of the air-passages, until the peculiar irritability of these parts was allayed, when the tube was introduced, and a solution of the nitrate of silver was injected into the bronchi. An issue was applied to the left chest, and the following mixture internally administered in doses of a fluid drachm twice daily:—

R. Decoct. Senegæ, ℥iv; Potassæ Iodid., ℥iiss; Tr. Opii Camph.; Syr. Tolutan. aa ℥j. Fiat misturæ.

The patient began to mend with the commencement of the topical applications, but his improvement was much more rapid after the injections were employed.

All his unfavorable symptoms diminished daily, so that by the fifth of October he felt sufficiently restored to return to his home—and he left the city on the above date, greatly improved in health.

CASE IX.—Mrs. M., aged thirty-eight, of this city, consulted me, February 2d, 1855, for a bronchial disease of six years standing. Several years before, when engaged in general practice, I had attended this lady in her confinement, at which time the bronchial affection, under which she labored, was somewhat aggravated by the occasion; she, however, regained her ordinary degree of health, but the bronchial disease still continued.

During an absence abroad, in 1851, this lady passed under the care of another physician, who continued to attend her until within a short time of the above period. An examination of Mrs. M.'s case, at this time, revealed follicular disease of the pharyngo-laryngeal membrane, œdema of the epiglottis, with ulceration of the sub-tonsillary fossæ, attended with almost complete aphonia. The physical signs present indicated extensive bronchitis of both sides of the chest. The cough was very severe, and large quantities of a ropy, adhesive expectoration—sometimes muco-purulent in its character—were daily discharged. All these symptoms had become much aggravated during the few months which preceded her visit to me.

The treatment was first directed to the throat and larynx. Applications of a strong argentine solution were made to the fauces, about the epiglottis, and into the larynx, every second or third day, for several weeks.

Under this treatment, the ulcerations of the fossæ were healed, the inflammation and œdema of the epiglottis subdued, and the patient's voice restored, but the bronchial disease continued.

March 7th—The tube for the first time was passed down the trachea, and a drachm or a drachm and a half of the solution injected into the bronchi. These operations, with the occasional application of the sponge-probang to the fauces and

larynx, were continued until the 6th of April, when the patient was dismissed cured.

February 3d. 1856—Have seen Mrs. M. to-day. She has had, since her treatment, and still enjoys, a good degree of health.

IV.—Cases of Spasmodic Asthma Treated by Bronchial Injections.

In the recent valuable work of Prof. Watson, of Glasgow, "On the Topical Medication of the Larynx," he has reported several cases of spasmodic asthma, as having been successfully treated by means of topical applications of the nitrate of silver to the larynges of his patients. The following case will be read with much interest.

CASE X.—"A lady,* above middle age, had for several years been the subject of chronic bronchitis, when suddenly, and without any very apparent cause, she was seized with a marked attack of spasmodic asthma, and after a short but severe illness, she found her former symptoms importantly changed. The violence of the cough was diminished, but it came on in fits of a rapid succession of short coughs; the expectoration was not so profuse as formerly, but the dyspnœa, which preceded and accompanied the fits of coughing, was so great as to oblige her to maintain the sitting posture day and night. I need not add that her face had a livid color and most anxious expression, and that her extremities were apt to become cold. The physical signs corresponded with the general symptoms of disease.

The percussion sound was less clear than natural, the respiratory murmur was feeble and obscured by loud bronchial and consonating râles, and it was entirely absent for a short time during each paroxysm. Its restoration was ushered in by a long stridulous inspiration and loud sonorous ronchi throughout the chest.

Here, then, was a case of chronic bronchitis ending in asthma; and there can be no doubt that the glottis was very much affected by the spasmodic contraction which characterizes

* On the Topical Medication of the Larynx in Certain Diseases of the Respiratory and Vocal Organs. By Eben Watson, M.D., &c. p. 133 et seq.

that disease. If anything is wanted to prove this, it is to be found in the nature of the treatment which was successfully employed in combatting the disease. For, with the exception of a few blisters, to counteract the bronchial inflammation, and some anodyne draughts to procure ease and gain time, the only remedial means used were topical applications of a solution of caustic to the glottis. In three weeks the patient was free from all asthmatic tendency, the bronchitis remaining little changed from what it had been for years previously; and it is worthy of remark, though I do not wish to build anything upon it, that no return of the asthma has occurred since the one attack just mentioned, which happened fully two years ago."

The employment of injections of a solution of nitrate of silver, instead of the sponge-armed probang, in the treatment of diseases of the air-passages, is only a more extended application of the same remedy to the remoter diseased parts.

When the morbid action is limited to the glottis and larynx, the appropriate medication of these localities will be sufficient to arrest the disease; but who does not perceive, in this case of Dr. Watson's, that, if the bronchial membrane had been injected by the same solution that was successfully applied to the affected larynx, the chronic disease of this tissue might also, in all probability, have been arrested. In the last edition of my work on Diseases of the Air-passages, several cases of spasmodic asthma are recorded, in the treatment of which cauterizations of the larynx were employed with complete success. The following is one of these cases:

CASE XI.—Mr. B.,* aged forty-seven, from Ohio, came under my care in 1847. He was laboring under an aggravated form of asthma, which had affected him for years. The disease was accompanied, and indeed had been preceded, by a chronic inflammation of the muciparous glands of the pharyngo-laryngeal membrane. At first, the attacks of asthma occurred at irregular intervals, a period of many weeks sometimes intervening between the paroxysms. At the time of my first seeing the patient, the fits of the disease had attained a frequency and a severity such as to deprive him of all enjoyment, and at times,

* A Treatise on Diseases of the Air-Passages. p: 289 et seq.

almost to destroy life. For many months preceding his visit to New York, the paroxysms came on during every night, at almost the same hour, and continued, with the greatest severity, for a period of from two to four hours, and, in many instances, such was the oppression of the chest, that his life was despaired of by his friends. This was the case the night after his arrival in the city. The attack came on at two o'clock, the usual hour, and continued, with unusual severity, until six o'clock in the morning. I saw him for the first time the following day, and found him very feeble, and still breathing with considerable difficulty. As all the ordinary remedies, I found, had been employed in his case unsuccessfully, it was proposed at once to cauterize the larynx with the nitrate of silver.

The patient expressed his fears that the application would produce an immediate return of the spasm, as it was now not unfrequently brought on by inhaling dust, and even, in some instances, by an attempt to swallow food or liquids. The pharynx and fauces were, however, cauterized, with a strong argentine solution, and as no very great irritation was induced by this measure, the sponge saturated with this fluid was soon after passed freely into the larynx. A moderate degree of spasmodic action of the glottis, and a severe fit of coughing, followed this last operation, but these quickly subsided, and the patient's respiration was performed with more freedom soon after the first application.

The return of the usual hour for the occurrence of the paroxysms was watched with considerable anxiety, by the patient and his friends, but he passed a very comfortable night, with only some cough and a slight difficulty of breathing, which came on for a short time, at the hour of the expected paroxysm. The next day the larynx and the trachea were again cauterized; and this operation was repeated daily, for two weeks, but after the second application, there was no return whatever of the paroxysms of asthma.

The patient remained several weeks in the city, and exposed himself, in various ways, in order, as he declared, "to test the cure," but returned to his home in Ohio without a recurrence of the disease.

One year after his treatment, this gentleman being in New

York, called at my office, in good health, and stated that he had had no return of his asthmatic symptoms, except in one instance, when, having been exposed to inclement weather, he had suffered, for one night, from a slight attack of his difficulty ; but a single application of the nitrate of silver to the larynx, which his family physician had learned to make, arrested perfectly the disease.

Since the publication of the above case, and others of spasmodic asthma, which are recorded in the same work, I have treated many other patients affected with this disease, and in most instances with gratifying success ; but, whenever the disease is complicated with bronchitis, (and this is frequently the case,) this form of the affection is arrested with much greater certainty, if the topical medication of the larynx is followed by the employment of bronchial injections, as the following case will illustrate.

CASE XII.—December 25th, 1854, I was consulted by Mrs. A., of Ohio, regarding her case, which was one of long standing, and of much severity. Her physician, an intelligent and experienced practitioner, accompanied her, and was present at the first examination, and remained in town to observe the subsequent treatment of her case.

Mrs. A. had been affected several years with chronic folliculitis of the pharyngo-laryngeal membrane, and with enlarged and diseased tonsils.

Auscultation revealed signs of extensive bronchitis, with pulmonary emphysema. Slight dulness, under the right clavicle, was found on percussion, with rude respiration. The patient was feeble and emaciated. She had a severe cough, with constant dyspnœa, and large muco-purulent expectoration. But the most troublesome and harassing feature of her complaint was the occurrence, nightly, of a severe and distressing attack of spasmodic asthma, so severe as to deprive her entirely of sleep during the whole night. It was only after the appearance of daylight, by being supported in a sitting posture, that a brief period of repose could be obtained. These attacks had continued to occur for several months every night, and with great regularity. All the ordinary remedies, Dr. P. informed

me, had been employed in the management of the case, without obtaining any material alleviation of the symptoms.

In commencing the treatment of Mrs. A.'s case, the enlarged and diseased portions of the tonsillary glands were removed; applications of a strong solution of the nitrate of silver were made, daily, to the pharyngo-laryngeal and tracheal membrane. The iodide of potassium, in a decoction of polygala senega, together with anti-spasmodics, was internally administered. The cough and expectoration were somewhat diminished under this treatment, but the periodic attacks of asthma were in no degree relieved.

On the 4th of January, instead of employing the sponge-probang, the elastic tube was introduced, and one drachm and a half of the nitrate of silver solution injected into the bronchi. These operations with the tube, alternating them with the use of the probang, were continued until the fifteenth of the month, when the patient left the city for her home in Ohio. After the second operation of catheterism in Mrs. A.'s case, the severity of her symptoms was considerably diminished. Her cough, expectoration, and difficulty of breathing, were all improved; and several nights before leaving the city, she slept quietly all night, without any return of the paroxysms of asthma.

Mrs. A.'s physician, who had remained during this time in New York, and had observed the progress of her case, accompanied her home, and continued the treatment. She has since, as he writes me, quite recovered.

I shall finish these observations by the report of one case, which cannot fail to be of interest, in which catheterism of the bronchi, although apparently indicated, failed entirely of affording relief. This case was seen by many physicians of this city, who, during the progress of the treatment, watched with much interest its effects upon the patient.

CASE XIII.—October 23d, 1854, Mrs. A., aged thirty-eight, of this city, consulted me about her case. She has suffered several years from laryngeal and bronchial disease, coughs much, and expectorates largely an adhesive mucus. Is subject to occasional attacks of spasmodic coughing, accompanied by difficult, or asthmatic breathing, which at times is very severe.

Mrs. A. is thin and pale, has a narrow chest, and a phthisical aspect. She has no aphonia, yet there is something peculiar in the sound of her voice, and her cough is ringing and dry at first, but expectoration follows, after coughing hard, for a time.

Bronchial râles are heard over the whole chest, but are most prominent in the left side. It is also slightly flat, directly under the clavicle of this side.

She has night perspirations, and the expectoration has been often tinged with blood. The mucous membrane of the throat is inflamed and covered with enlarged follicles, and the uvula elongated.

That plan of treatment which appeared to be plainly indicated by the above symptoms, was adopted. The uvula was truncated; the iodide of potassium, in a decoction of senega, was administered, and a course of cauterizations of the pharyngo-laryngeal membrane entered upon, with the intention, not only of improving these localities, but for the purpose of preparing the parts for the use of the bronchial tube.

After the occasional application of the sponge-probang, for a period of two or three weeks, the injections were used with the confident expectation that benefit would follow their employment as it had, in other similar cases. But the paroxysms of coughing, and other severe symptoms, were in no degree mitigated by this form of medication.

On the 3d of January, after a violent fit of coughing, she expectorated a scab, with an irregular border, about half an inch in diameter, which had every appearance of having come from an ulcerated surface, for the edge of the scab, on one side, was bloody, as if recently separated from its attachment. The patient declared that it came "from the wind-pipe," and she could place her finger on the point, just above the sternum, where she was positive it came from; for it was loosened, she affirmed, several hours before she could detach it, and occasioned an incessant and violent coughing until it was thrown off. The cough and expectoration continued after this, but the paroxysms for a time were not quite so severe. They occurred, however, again, and soon became as distressing as ever, and after a few weeks another scab, resembling perfectly the former one, was coughed up.

It was now proposed to cauterize the spot, by passing the sponge-armed probang (which had before only been introduced into the larynx) through the trachea down to its bifurcation. This operation I succeeded in accomplishing. It was repeated two or three times a week, for several weeks. Under this treatment Mrs. A. improved rapidly. No perfectly-formed crust was thrown off after these applications to the trachea were commenced; several small portions were, from time to time, discharged, but the paroxysms of cough became less and less, the expectoration diminished in quantity, and the patient improved constantly in health and strength, and is at this time in the enjoyment of a good degree of health, having had no treatment for the last six months.

In this case, the application of the solution to the irritated bronchial membrane, was of no advantage, apparently, while the local ulceration, on which it probably depended, was progressing.

It would not be difficult to select many other cases, the details of whose history, and the result of whose treatment, would be fully equal in interest to any of those which have been given. But, in making this selection, I have aimed to report those cases which have been, and are, well known to other medical men, by whom, in most instances, the patients have been committed to my care.

The Immediate Effect of the Operation of Catheterism of the Air-Passages.

It is perhaps unnecessary for me to repeat here, what I have insisted upon from the very commencement of my recommendation of topical medication—that this operation of introducing the tracheal tube, as well as that of the sponge-armed probang, into the larynx and trachea—an operation difficult of performance, under the most favorable circumstances—cannot be accomplished, “and it should never be attempted, until the parts implicated are thoroughly *educated* by the necessary preparatory operations. These operations consist in cauterizing, successively, the pharynx, the opening of the glottis, and the larynx, for several days, (even for weeks, if necessary,) before the

introduction of the injecting tube into the trachea and bronchi."

In an excellent work recently published in Paris, by M. Sestier, on œdematous laryngeal disease, ten cases of œdema of the glottis or of the larynx are reported, in which a gum elastic sound was introduced into the larynx and trachea, and retained there for a longer or shorter period, through which the patients were enabled to respire, thereby preventing suffocation, until, in several instances, the disease was overcome, and the lives of the patients saved.

The introduction of the sound, under these circumstances, M. Sestier remarks,* produced some degree of pain, and a sudden, violent cough. But these symptoms very soon subsided, and they became much less marked at each subsequent introduction of the sound, whenever it became necessary to withdraw the instrument, in order to cleanse it, or for any other purpose.

All violent symptoms, however, may to a great degree be prevented, ordinarily, by adopting the preparatory course I have recommended. Should a spasm of the glottis occur, as this may happen, notwithstanding every precaution, the operator should withdraw the tube at once, and delay all further attempts until the irritation has entirely subsided.

The immediate effect of tracheal injections on the disease, has in many instances been quite remarkable. In bronchial disease, and in the earlier stages of tuberculosis, the effect of the first injection, in most cases, has been to diminish the expectoration, and greatly to lessen the cough.

In a few cases, the operation has produced a spasm of the glottis, which has been followed by severe coughing, dyspnoea, and increased bronchial irritation, that has lasted for twelve or twenty-four hours. But, I have never known a case of this kind in which any injury has ultimately followed. On the contrary, some cases have appeared to be greatly benefitted by this operation when thus severe. This was especially the result in the case of Miss H., a young lady of this city, aged seventeen, who had been recommended to my care by her friend, Dr. Crawcour, of New Orleans. She had suffered several years from

* *Traité de l'Angine Laryngée Œdémateuse.* p. 390 et seq.

chronic, bronchial disease, had been subjected to much medical treatment, without obtaining any permanent relief.

In September, 1854, she came under my care. The ordinary signs of bronchitis were very marked. Topical applications of the nitrate of silver solution were made to the glottis and larynx, and the general remedies, heretofore recommended in such cases, were administered. This course of treatment was continued several weeks, without producing any decidedly beneficial effect upon the patient.

At this time, Dr. Crawcour being in the city, I saw the patient on several occasions, in consultation with this gentleman, who advised a further perseverance in the plan of treatment, but suggested the employment of catheterism of the bronchi, (an operation he had seen performed in similar cases several times upon my patients,) if the present measures should be unsuccessful after a farther trial.

But her disease continued to resist the influence of those measures which had proved quite successful in the management of other apparently similar cases. On the 7th of November, therefore, the bronchial tube was with some difficulty introduced, and nearly a drachm of the solution injected into the bronchi. An unusual amount of irritation followed this operation.

The introduction of the tube induced a spasm of the glottis ; the patient coughed severely, and complained, while she remained in the office, of pain in the larynx and bronchi. She, however, left soon after the operation for her house in the upper part of the city, but did not return for any further treatment. The subsequent history of her case has since been obtained from herself and her mother.

The cough and bronchial irritation continuing, after her return home, the patient and her friends became alarmed, and called in their ordinary medical attendant, who, in turn, called in a consulting physician, but both concluded to do nothing, for the irritation gradually subsided, and, along with it, the alarm of the patient and her friends ; and, still better, the cough and bronchial disease, which had so long and so obstinately resisted other measures, entirely disappeared ; and the young lady has continued in good health up to the present time.

I have before stated that a spasm of the glottis will occasionally occur on the introduction of the tube, although great pains may have been taken to prepare the parts, by previous training. This is more likely to take place in persons of a nervous temperament, or when much excited, as patients sometimes are, at the idea of having an instrument passed down the *wind-pipe*, or by having several strange physicians present at the time of the operation. If, on the occurrence of the spasm, the sound is not withdrawn immediately, the convulsive action extends, and we have both *laryngismus* and *trachelismus* quickly produced, which will be followed by pain and soreness of the muscles of the neck and chest, and increased tracheal and sometimes bronchial irritation.

In the earlier period of this form of local treatment, I was accustomed to persevere in the operation (although a spasm might occur) until the process was completed. But this should not be done; and, had I followed the rule in the above case, which I have since adopted, namely, to remove the tracheal tube at once, when a spasm arises, and to delay the operation until all irritation has subsided, the disturbance which followed in the case of Miss H. would have been avoided.

If we analyze the *one hundred and six* cases reported in the following table, it will be found that *seventy-one* of the sum total have been recorded as cases of *tuberculosis*. Of this number, *thirty-two* were considered cases of *advanced phthisis*—cases in which tubercular cavities were recognized in one or both lungs, and *thirty-nine*, cases of *early phthisis*. Of the first division—advanced phthisis, *fourteen* have since died. *Twenty-five* were more or less improved, their lives being apparently prolonged by this means of medication. *Seven* only of the *thirty-two* cases of advanced phthisis were not benefitted by the injections.

Of the *thirty-nine* cases of *incipient tuberculosis*, *twelve* of this division have apparently recovered. *Five* more of this number are now, or were at the last report, in the enjoyment of a good degree of health. These five cases were classed by Dr. Richards with the twelve recoveries, making *seventeen* in all. But, as there is more doubt respecting the cases of these five than of the first twelve, I have not retained them in the class of cases cured.

With respect to the above twelve cases, I say *apparently* cured ; for, although the appearance of these patients, as manifested both by the physical and rational signs, is indicative of an ordinary degree of health, yet, in a disease like that of tuberculosis, every medical man is aware that one year is a period too brief to speak decidedly with regard to the positive and final result.

Of the remaining *twenty-two* cases, many of whom are still under treatment, *seventeen* have been greatly improved by topical medication ; *three* more have been moderately benefitted ; while *three* only have failed to obtain any advantage from the local measures which have been adopted.

Of the *twenty-eight* cases of *bronchitis*, *sixteen* have been dismissed cured, or so much improved as to require no further treatment. All the others have been greatly benefitted, although some are still under treatment.

Bronchial injections have been employed in six cases of asthma only. In the treatment of this disease, the application of a solution of the nitrate of silver, by means of the sponge-armed probang, to the larynx, will in most cases, it has been found, prove more certain and efficient in its effects than catheterism of the air-passages. Hence, in nearly all the cases of this disease which have come under my observation, they have been treated by direct applications of the caustic solution to the larynx and trachea. It was only when this disease was complicated with bronchial inflammation that the flexible tube was employed.

The six cases of asthma recorded in the table were all complicated with bronchial or pulmonary disease. In all except one the disease was removed by the use of bronchial injections. The single case not fully restored was that of a lady from Ohio, who left greatly benefitted, after three applications only of the injecting tube.

Statistical Table of One Hundred and Six Cases of Pulmonary Disease, Treated by Bronchial Injections, between October, 1854, and December, 1855.

Date.	No	Sex.	Age.	Residence.	Occupation.	Form of Disease.	Duration prior to treatment.	Duration of treatment.	First effect of treatment.	General Results.
1854. Oct.										
"	1	Female.	30	Long Island.		Advanced Phthisis.	1 year.	3 mos.	Improved.	For several weeks the patient was much improved, but died after a few months.
"	2	Male.	25	Brooklyn, N. Y.	Goldsmith.	Phthisis following folliculitis.	3 years.	2 mos.	"	First six months remained nearly the same, but gradually declined, and died a few months later.
"	3	"	45	N. Carolina.	Physician.	Phthisis, complicated with bronchitis.	2 years.	1 mo.		Did not improve during the first week; afterwards improved rapidly. Recovered. Has since been constantly engaged in practice.
"	4	"	28	Harlem.	Builder.	Phthisis.	1 year.	8 mos.	"	Was greatly benefited by treatment—able to attend business until this Winter. Advised to go South.
"	5	"	25	New York.	Hotel keeper.	Phthisis.	6 months.	3 mos.	"	Improved a little at first, but died subsequently.
"	6	Female.	22	"			6 months.	2 mos.		Left without being improved.
"	7	Male.	28	San Francisco.	Broker.	Laryngeal phthisis.	9 months.	2½ mos.	Not improved.	Greatly improved. Left for California, apparently well.
"	8	Female.	20	New Jersey.		Phthisis following folliculitis.	18 months.	2 mos.	"	Left much improved.
"	9	Male.	40	New York.	Machinist.	Bronchitis with bronchial dilatation.	5 years.	12 mos.	"	Greatly improved. Was nearly well, when an attack of fever increased his malady. Again improved, and left for Mexico.
"	10	"	30	Brooklyn.		Laryngeal phthisis.	1 year.	8 mos.	"	Much improved by treatment.
"	11	Female.	36	New York	Merchant.	Phthisis with small cavity in right lung.	3 years.	8 mos.	"	This lady, when first seen, with her attending physician, was confined to her bed. She has quite recovered.
"	12	"	40	New Orleans.		Bronchitis.	10 months.	1 mo.	"	Greatly benefited. Left for home, feeling quite well.
"	13	Male.	25	W. New York.		Advanced phthisis.	6 months.	1 mo.	"	Improved under treatment. Obligated to return home.
"	14	"	45	Connecticut.	Farmer.	Bronchitis, complicated with phthisis.	2 years.	2 mos.	Not improved.	Left without any decided improvement.
"	15	Female.	35	New York.		Advanced phthisis.	18 months.	3 mos.	Improved.	Improved for a time, but disease continued. Died.
"	16	"	32	Orange Co.	Wid. phys'n.	Advanced phthisis.	4 years.	2 mos.		Greatly improved, and continues so.
"	17	"	30	New York.		Advanced phthisis, complicated with syphilis.	1 year.	1 mo.	Not improved.	Died following Winter.
"	18	"	20	Poughkeepsie.		Bronchitis, with signs of tubercles in one lung.	1 year.	1 mo.	Improved.	Entirely recovered.
"	19	"	40	Niagara.		Severe bronchitis, with emphysema.	20 years.	6 mos.	"	Was greatly improved by the treatment. Still continues improved.

Table of One Hundred and Six Cases of Pulmonary Disease, Treated by Bronchial Injections.—(Continued.)

Date.	No.	Sex.	Age.	Residence.	Occupation.	Form of Disease.	Duration prior to treatment.	Duration of treatment.	First effect of treatment.	General Results.
1854.										
Nov.	20	Male.	25	Illinois.		Advanced phthisis.	2 years.	8 mos.	Improved.	Much improved. Left for the South, got worse, and died.
"	21	Female.	30	New York.	Clerk.	Laryngeal phthisis, with asthma.	3 years.	12 mos.	"	Had ulcerations of trachea. Greatly improved by cauterizations of the part. Remains better.
"	22	Male.	26	Massachusetts.	Builder.	Incipient phthisis.	1 year.	8 mos.	"	Recovered.
"	23	"	—	Virginia.		Phthisis, with aphonia	1 year.	2 mos.	"	For a time improved, but not permanently. Gone South for the Winter.
"	24	Female.	17	New York.		Severe bronchitis.	5 years.	1½ mos.	"	Improved slightly under use of sponge-probang; which was continued twice a week for six weeks; then one injection was employed, followed by great bronchial irritation, after which the patient recovered perfectly.
	25	Male.	27	Ohio.	Banker.	Phthisis, with bronchitis.	6 months.	2 mos.	"	Was greatly benefitted. Returned home after two or three weeks, appearing quite well. Got worse in the Fall, returned, and was again much improved by treatment.
"	26	Female.	25	New York.		Phthisis.	1 year.	2 mos.	"	Remains about the same.
"	27	Male.	30	"	Tailor.	Bronchitis, with bronchial dilatation.	1 year.	4 mos.	"	Dismissed cured.
Dec.	28	"	40	Virginia.	Professor of Law.	Bronchitis, complicated with tubercles.	9 months.	1 mo.	"	
"	29	"	50	Maine.	Surveyor.	Advanced phthisis.	1 year.	1½ mos.	"	Dismissed cured.
"	30	"	30	Kentucky.	Merchant.	Advanced phthisis.	1½ years.	1 mo.	Greatly impr'd for a time.	Improved for a time, and returned home, and died some months after.
"	31	"	40	New York.	Blacksmith.	Advanced phthisis.	3 years.	8 mos.	Impr'd at first.	Not improved ultimately.
"	32	"	34	"	Mechanic.	Bronchitis.	5 years.	4 mos.	Improved.	Died in the Spring.
"	33	"	45	Connecticut.	Farmer.	Bronchitis, with tubercles.	2 or 3 yrs.	2 mos.	"	Continues much improved.
1855.										
Jan.	34	Female.	26	Ohio.		Bronchial asthma.	2 years.	1 mo.	"	Returned home. Got worse the following Spring, and died.
"	35	Male.	35	New York.	Merchant.	Phthisis.	2 years.	1 mo.	"	Returned. Treatment continued by her physician; and she ultimately recovered.
"	36	"	50	Indiana.		Phthisis.	3 years.	2 weeks.	"	Fourth operation produced severe spasms, and patient refused further treatment.
										Returned to Indiana greatly improved. Not heard from since

Table of One Hundred and Six Cases of Pulmonary Disease, Treated by Bronchial Injections.—(Continued.)

Date.	No	Sex.	Age.	Residence.	Occupation.	Form of Disease.	Duration prior to treatment.	Duration of treatment.	First effect of treatment.	General Results.
1855.										
Jan.	37	Female.	42	New Jersey.		Laryngitis, with bronchitis.	2 years.	3 mos.	Improved.	Remained nearly the same through Summer. Gone South the present Winter.
"	38	"	30	Choctaw Nat'n. Connecticut.	Teacher.	Phthisis.	1½ years.	3 mos.	"	Left for Arkansas greatly improved.
"	39	"	30	"	"	Laryngitis, with bronchitis.	4 years.	3 mos.	"	Continues greatly improved.
Feb.	40	Male.	28	Kingston, N. Y.	Merchant.	Phthisis.	4 years.	2 mos.	"	Recovered.
"	41	"	30	New York.	Broker.	Advanced phthisis.	2 years.	3 mos.	"	Improved under treatment. Went South. Died some months after.
March	42	"	20	Wheeling, Va.	Student.	Phthisis.	1 year.	2 mos.	"	Left for home greatly improved. Not heard from.
"	43	Female.	25	Connecticut.	"	Advanced phthisis, with aphonia.	Unknown.	1 mo.	"	Regained voice, and left much improved. Not heard from.
"	44	"	43	New York.	"	Bronchitis, with asthma.	5 or 6 yrs.	2 mos.	"	Recovered.
May.	45	Male.	28	Vermont.	Physician.	Phthisis.	2 years.	2 mos.	"	Ultimately not much improved.
"	46	"	26	New York.	Farmer.	Advanced phthisis.	1 year.	2 mos.	"	Not improved ultimately. Died.
"	47	Female.	54	"	"	Bron., with asthma.	5 years.	2 weeks.	"	Much improved
"	48	Male.	28	Maine.	Physician.	Advanced phthisis.	6 months.	2 mos.	"	Much improved at first. Went home and died.
April.	49	Female.	30	"	"	Advanced phthisis.	1 year.	1 mo.	"	No permanent improvement.
"	50	Male.	48	Minnesota.	Merchant.	Advanced phthisis.	1 year.	3 mos.	Much improv'd	Left for the country greatly improved. Continued better for several months. Got worse the following Winter, and died.
"	51	"	30	New York.	"	Advanced phthisis.	2 years.	3 mos.	"	Greatly improved. Spent the following Summer at Lake Superior, and returned the present Winter. Still better.
May.	52	"	45	"	"	Advanced phthisis.	18 months.	4 mos.	"	Has continued greatly improved since the occurrence of cold weather.
"	53	"	26	Maine.	Mechanic.	Phthisis.	6 months.	½ mo.	"	Returned home much improved. No report since.
"	54	"	25	Utica.	Merchant.	Phthisis.	1 year.	4 mos.	"	Left in apparent health. Not since heard from.
"	55	Female.	26	Haverstraw.	"	Advanced phthisis.	2 years.	2 mos.	Improved.	Appeared better for some time under treatment. Went home, and died several months after.
"	56	Male.	22	Indiana.	Farmer.	Advanced phthisis.	1 year.	1 mo.	Much improv'd	Left for Indiana greatly improved. No report since.
"	57	"	20	Virginia.	Student.	Phthisis.	1 year.	2 mos.	"	Went home much better. Since heard he is still better.
"	58	"	40	"	Planter.	Advanced phthisis.	2 years.	1½ mo.	Improved.	Not much improved ultimately. Nearly the same at last report.
"	59	"	30	"	"	Phthisis.	1½ years.	1 mo.	Much improv'd	Was greatly improved, and still continues better.

Table of One Hundred and Six Cases of Pulmonary Disease, Treated by Bronchial Injections.—(Continued.)

Date.	No.	Sex.	Age.	Residence.	Occupation.	Form of Disease.	Duration prior to treatment.	Duration of treatment.	First effect of treatment.	General Results.
1855.										
May.	60	Female.	23	New York.		Advanced phthisis, with aphonia.	2 years.	1 mo.	Much improv'd.	Continues decidedly improved.
"	61	Male.	28	"	Carpenter.	Bronchitis.	1 year.	6 mos.	"	Cured.
June.	62	"	30	Canada.	Merchant.	Bronchitis, with aphonia.	1 year.	1 mo.	Improved.	Left nearly well.
"	63	"			Mechanic.					Cured.
"	64	Female.	20	Brooklyn.		Severe bronchitis.	1 year.	4 mos.	Much improv'd	Left without improvement.
"	65	"	35	Baltimore.		Advanced phthisis.	2 years.	1 mo.	Not improved.	Dismissed apparently cured.
"	66	"	19	New York.		Phthisis, with bronchitis.	2 years.	4 mos.	Much improv'd	
"	67	Male.	28	Virginia.		Advanced phthisis.	1½ years.	1 mo.	Not improved.	Returned home not improved.
"	68	Female.	25	Pennsylvania.	Mechanic.	Phthisis.	1 year.	2 mos.	Improved.	Returned home greatly improved.
July.	69	"	26	Indiana.		Advanced phthisis.	2 years.	3 mos.	"	Left much improved. Since writes she is well.
"	70	"	45	Alabama.		Phthisis.	1 year.	1½ mos.	"	Greatly improved. Cough nearly gone when leaving for home. Not heard from.
"	71	Male.	46	Buffalo.	Clerk.	Advanced phthisis.	2 years.	1 mo.	Not improved.	But little change from the treatment.
"	72	"	18	Long Island.	Student.	Advanced phthisis.	1½ years.	4 mos.	Improved.	Was greatly benefitted. Continued improved when last heard from.
"	73	"	30	Virginia.	Merchant.	Advanced phthisis.	6 months.	2 mos.	"	Much improved at first, but failed, and died four months later.
Aug.	74	Female.	35	Connecticut.		Advanced phthisis.	3 years.	1½ mos.	"	Left much better. No report since.
"	75	"	22	Massachusetts.		Severe bronchitis.	10 months.	½ mo.	"	Improved, and left for home.
"	76	Male.	28	New Jersey.	Clergyman.	Phthisis, complicated with bronchitis.	1 year.	1 mo.	"	Left greatly improved, and has so continued.
"	77	"	32	Virginia.	Planter.	Advanced phthisis.	1½ years.	2 mos.	"	Is greatly improved. Preaches every Sunday.
Sept.	78	"	26	Pennsylvania.	Farmer.	Severe bronchitis.	3 years.	1 mo.	"	Returned home improved. No report.
"	79	"	32	Ohio.	Laborer.	Phthisis, with disease of the heart.	1 year.	12 days.	Not improved.	Left nearly well.
"	80	"	35	New York.	Teacher.	Advanced phthisis, with mesenteric ulceration.	1 year.	1 mo.	No change.	Died.
"	81	"	22	Alabama.	Student.	Advanced phthisis.	1½ years.	1 mo.	Improved.	Left, no better. No report.
"	82	"	35	Staten Island.	Merchant.	Phthisis.	3 years.	4 mos.	"	Improved slightly at first. Left, really no better. Since died.
"	83	Female.	24	Ohio.		Long-standing bronchitis, with asthma.	15 years.	2 mos.	"	Continues greatly improved.

Table of One Hundred and Six Cases of Pulmonary Disease, Treated by Bronchial Injections.—(Continued.)

Date.	No	Sex.	Age.	Residence.	Occupation.	Form of Disease.	Duration prior to treatment.	Duration of treatment.	First effect of treatment.	General Results.
1855. Oct.	84	Female.	—	Florida.		Severe bronchitis, with emphysema, &c.	3 years.	2½ mos.	Improved.	Considerably improved under treatment.
"	85	Male.	32	Tennessee.	Sadler.	Phthisis, with aphonia	1½ years.	1 mo.	"	Left much better. Voice restored.
"	86	Female.	24	Massachusetts.		Phthisis, with aphonia two years.	2½ years.	3 mos.	"	Remains greatly improved. Voice partially restored.
"	87	"	35	New York.		Extensive bronchitis, with emphysema.	1 year.	3 mos.	"	Improved rapidly at first. Still occasionally treated.
"	88	Male.	30	Jersey City.	Custom of- ficer.	Severe bronchitis, with incipient phthisis.	6 months.	3¼ mos.	"	Greatly improved. Quite well.
"	89	"	26	New Jersey.	Mechanic	Bronchitis, with incipient phthisis.	6 months.	2½ mos.	"	Greatly improved.
"	90	"	25	Virginia.	Physician.	Bronchitis, with incipient phthisis.	1 year.	1½ mos.	"	Much improved. Went to Florida for the Winter.
"	91	"	30	New York.	Author.	Phthisis.	2 years.	4¼ mos.	"	Very much improved.
"	92	Female.	20	Virginia.		Early phthisis.	1½ years.	2 mos.	"	Left greatly improved.
"	93	Male.	28	Ohio.	Student.	Phthisis.	6 months.	1 mo.	"	Left much improved.
"	94	"	22	"		Bronchitis, complicated with epilepsy.	10 years.	1½ mos.	"	Went home greatly improved.
Nov.	95	"	38	New York.	Conductor.	Advanced phthisis, with bronchitis.	4 years.	3 mos.	"	Is much improved.
"	96	"	30	Kingston.	Merchant.	Phthisis, with aphonia.	2 years.	3 mos.	"	Still much improved. Voice restored.
"	97	"	28	New York.	Merchant.	Advanced phthisis.	1 year.	1½ mos.	"	Greatly improved.
"	98	"	26	"	Farmer.	Phthisis.	3 years.	2 mos.	"	Improved very much.
"	99	"	22	Florida.	Carpenter.	Advanced phthisis.	1 year.	1 mo.	"	Improved at first. Declined rapidly ultimately, and died last of November.
"	100	Female.	24	Brooklyn.		Severe bronchitis, with asthma.	2 years.	5 mos.	"	Cured.
"	101	"	35	New York.		Bronchitis.	2 years.	3 mos.	"	Greatly improved. Is quite well.
"	102	Male.	26	Kentucky.	Merchant.	Early phthisis, with bronchitis.	1 year.	2 mos.	"	Left appearing well.
"	103	Female.	19	Virginia.		Advanced phthisis.	2 years.	1 mo.	Not improved.	No report.
"	104	Male.	65	New Jersey.	Merchant.	Bronchitis, with bronchial dilatation.	5 years.	5 mos.	Improved.	Continues improved.
Dec.	105	"	25	New York.	Farmer.	Laryngeal phthisis.	6 months.	10 days.	"	Improved. Obligated to return home.
"	106	"	30	Williamsburgh	Teacher.	Phthisis, with aphonia	1 year.	1½ mos.	"	Greatly improved.